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Indiana State Department of Health

Epidemiology Resource Center
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Rabies and Bats

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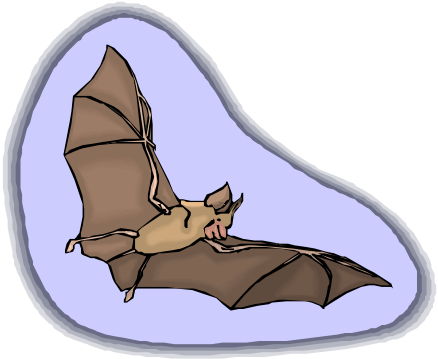

Bats are one of Indiana's most misunderstood mammals. They fill an important environmental niche, yet most people fear them because they are only seen at night and/or otherwise are very shy. Although most public health discussions about bats focus on their capability to transmit rabies, which is a legitimate concern, but we should also recognize the importance of bats in the environment. Indiana's bats are insectivores and are the primary predators of night-flying insects. A single little brown bat can consume up to 1,200 mosquito-sized insects in an hour. Bats serve as predators of Indiana's most costly crop pests. Cutworm moths, corn earworm moths, armyworm moths, and cucumber beetles are just a few of the many insects they consume.

Rabies in insectivore bats was first diagnosed in the United States in Florida in 1953. The first rabid bat was identified in Indiana in 1965, and the ISDH Rabies Laboratory has identified 360 rabies positive bats since then. No human deaths have been attributed to bat rabies in Indiana. Indiana counties that have submitted rabid bats are shown in Figure 1. It is likely that rabid bats will eventually be identified in all Indiana counties. Any bat found to be down and sick in any county should be considered rabid until proven otherwise.

Only a small number of bats actually have rabies. Testing of normally behaving bats suggests that less than 1% of free ranging bats have rabies. Only 5% of the sick or unnatural acting bats submitted to the Indiana rabies laboratory for testing over the past 20 plus years have been positive, which supports observations that only a small number of bats actually have rabies. In 2000, the ISDH Rabies Laboratory examined 380 bats for rabies and found 14 (3.6%) to have rabies. Rabid bats by species were 2 *Pipistrellus subflavous*, 5 *Eptesicus fuscus* (Big Brown), 6 *Lasiurus bore*alis (Red Bat), and 1 *Lasiurus cinereus* (Hoary Bat). These animals were submitted to the Centers for Disease Control and Prevention (CDC) for identification of virus variants. Because of its fondness for buildings as a roost and its large numbers, the Big Brown bat is the most frequently submitted bat.

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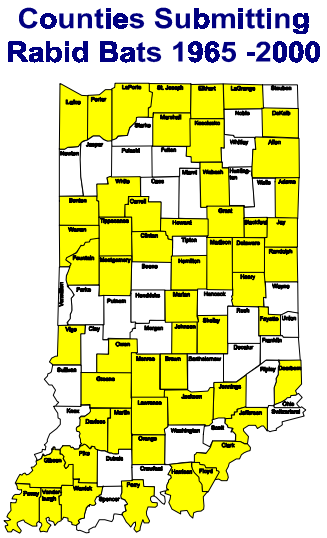
Figure 1.



Clinical rabies in bats is much like rabies in other mammalian species. They must be exposed to infected salvia of a rabid animal for disease transmission to occur. The clinical disease lasts approximately one week, during which time they suffer behavioral changes and progressive paralysis leading to death. Most bats have the "dumb" form of rabies and are not aggressive, but the big brown bat can be aggressive anytime it is cornered or handled and will bite repeatedly. It is during the clinical illness or shortly before that bats may transmit the virus to other bats or other animal species via a bite.

Since 1990, 24 people in the United States have died of rabies attributed to bat-associated rabies virus variants. In only two cases was the history of a bite established. In 11 of the cases contact with a bat was determined, but in the other 11 cases, no history of any bat contact was noted. It may be that bites did occur in the 22 non-bite cases, but they were not recognized as bites at the time or considered insignificant because bats do not inflict large, traumatic wounds. In some cases, individuals were unable to provide adequate histories when questioned about exposures because of their clinical illness. Although bat-variant rabies virus has been transmitted to terrestrial mammals, bat-variant rabies virus is rarely found in rabid terrestrial mammals and suggests that in the absence of other animal bite history, rabies transmission was from bats.

Individuals who are bitten by any mammal should wash the wound thoroughly and seek medical attention to evaluate the need for rabies post-exposure prophylaxis (PEP). When bitten by a dog, cat, or ferret, a 10-day observation period is used to determine the rabies status of the animals. In all cases where human-bat contact has occurred or is suspected, laboratory testing is the only method of determining the bat's rabies status and if possible, the bat should be captured for testing. In the event the bat is not captured, post-exposure prophylaxis should be considered.

Because of the number of cases of bat-variant rabies where individuals did not report a bat bite, the Advisory Committee on Immunization Practices (ACIP) has established a position on post-exposure prophylaxis when it is unclear that a bite or scratch occurred. PEP should be considered when direct human-bat contact has occurred, unless the exposed person can be certain that bite, scratch, or mucous membrane exposure did not occur. PEP may be considered for persons who were in the same room as a bat and may be unaware that direct contact or a bite occurred (i.e., a sleeping person awakens to find a bat in the room or an adult witnesses a bat in the room with an unattended sleeping child, mentally disabled person, or intoxicated person). If direct contact did not occur, PEP is not warranted. Local and/or state health officials can assist in this decision.

Catching a bat for laboratory examination is easier than it would seem. Bats should be captured only when human or pet exposure has occurred or is suspected to have occurred. It can be done safety; follow these guidelines:

1. Turn on room lights and close windows and doors.
2. Wear leather gloves and approach the bat slowly when it lands.
3. Place a coffee can, box, or bucket over the bat.
4. Slide a piece of cardboard under the can, box, or bucket to trap the bat, then tape the cardboard to the sides of the container in a way the bat cannot escape.
5. Contact the local health department for assistance in getting the bat submitted to the ISDH Rabies Laboratory.

Bat-proofing homes is the best method to prevent exposure in the home. Bats should not be allowed access to areas where people live. The homeowner can do bat-proofing with simple material. Examine your home for holes in siding, missing screens from attic vents, inoperative fireplace draft controls, or other areas where bats might enter. Bats can enter holes as small as 1/2 inch in diameter. These holes must be sealed and screens repaired. Holes where plumbing or electrical lines enter or exit the house should be filled with caulking. During the summer months, young bats that are unable to fly may be present, and excluding adult bats will leave young bats inside. It is best to avoid exclusion from May through August. A source of information for excluding bats is presented at www.batcon.org/binb/doityourself.html. Another source of information on bats and rabies can be found at www.cdc.gov/ncidod/dvrd/rabies/bats_&_rabies/bats&.htm

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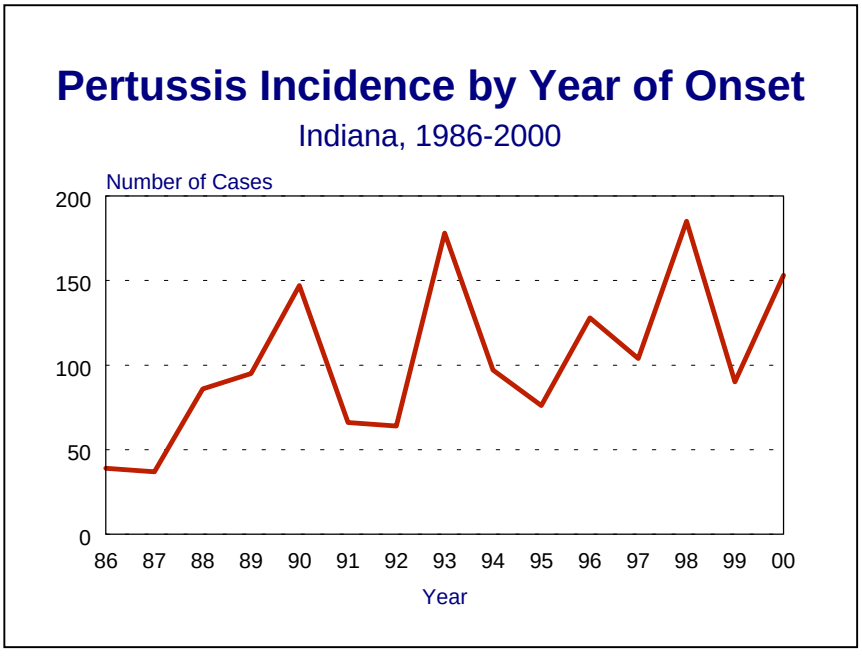
Pertussis - Adolescent Incidence and Seasonal Variation

Wayne Staggs, MS
ISDH Epidemiology Resource Center

Pertussis is the most frequently reported vaccine-preventable disease among children less than five years of age, but increased reporting of cases in adolescent and adult age groups have been observed recently. This report describes an increase in adolescent pertussis in Indiana during 2000 and seasonal variation of reported pertussis cases in previous years.

Last year, 153 cases of pertussis were reported in Indiana with 40 being culture confirmed and 6 PCR positive. The remainder of the 107 cases met the case definition for pertussis. Figure 1 shows pertussis incidence from 1986 - 2000 in Indiana.

Figure 1.

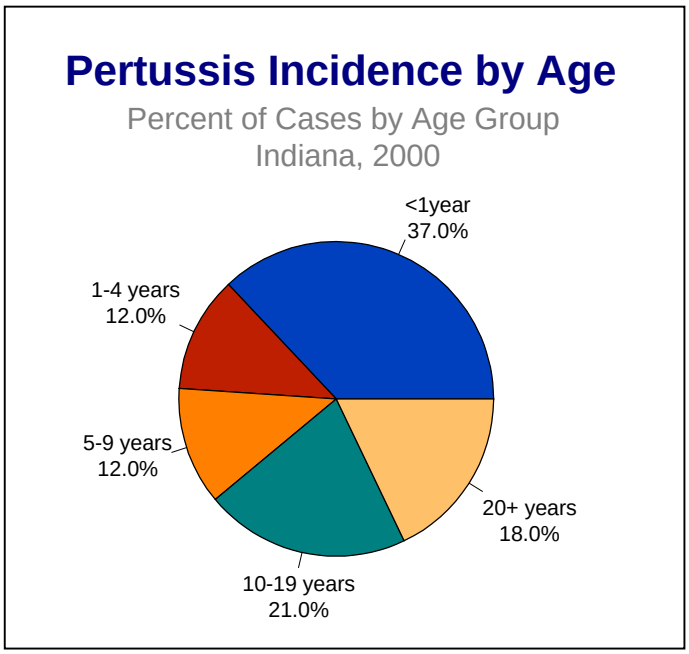


As this graph shows pertussis incidence, unlike other vaccine-preventable diseases, has not declined in recent years. Incidence has actually increased over the past 15 years. A mean of 80 cases per year was found for the period of 1986-1990; a mean of 96 cases per year for 1991-1995; and a mean of 132 cases annually for the period 1996-2000. It is generally believed that this long-term trend of increase in pertussis incidence is attributed to better recognition and reporting of suspected cases. Because of the cyclical nature of the disease, pertussis incidence normally peaks every 3-4 years. These peaks can also be seen in Figure 1.

Adolescent Pertussis Incidence

Since waning immunity following natural infection or vaccination occurs, pertussis can affect persons of any age. In 2000, Indiana saw an increase in 10-19 year-old individuals, with 21% (32 cases) of the 153 cases being in this age group. Since 1993, the percent of cases in this age group ranged from 9% to 12%. Increased awareness among health care providers that pertussis can occur in adolescence may account for a portion of the increased percentage. Outbreaks of pertussis occurred in the 10-19 age group in Allen and Dearborn counties last year with Allen County reporting 9 cases and Dearborn County reporting 8 cases in this age group. Infection occurring in junior and senior high schools accounted for some disease transmission in these two counties. Figure 2 shows the incidence of pertussis by age group in Indiana during 2000.

Figure 2.



Diagnostic Testing of Suspect Cases

The *Bordetella pertussis* organism is most easily recovered from nasopharyngeal mucus in the catarrhal or early paroxysmal stages of illness, and is rarely recovered after the fourth week of illness. It is recommended that both culture and DFA be done. False positive and false negative DFA results may occur. A positive culture is diagnostic, whereas false-negative cultures are common in patients receiving antibiotics. Because of difficulties with laboratory testing, clinicians often must make the diagnosis on the basis of clinical findings such as inspiratory whoop, post-tussive emesis and lymphocytosis. All symptomatic contacts to cases should be cultured prior to receiving antibiotic treatment, as well as all patients with an unexplained, sleep-disturbing cough. Special attention should be paid to infants, as well as adolescents and adults with mild illness that could represent pertussis. There is no charge for pertussis testing performed by the ISDH Laboratory. Pertussis test kit 2A may be obtained by writing or calling:

Container Section - Rm. 13 G
Medical Science Building
on the IUPUI Campus
635 North Barnhill Drive
Indianapolis, Indiana 46207-7202
317/233-8104

Directions for submitting specimens are enclosed in the pertussis test kit. For best results, pertussis specimens should be received in the ISDH Laboratory within 24 hours of collection (an overnight express is preferred shipping method). For additional help with specimen handling and shipment or test result interpretation, call the Special Reference Bacteriology Laboratory at

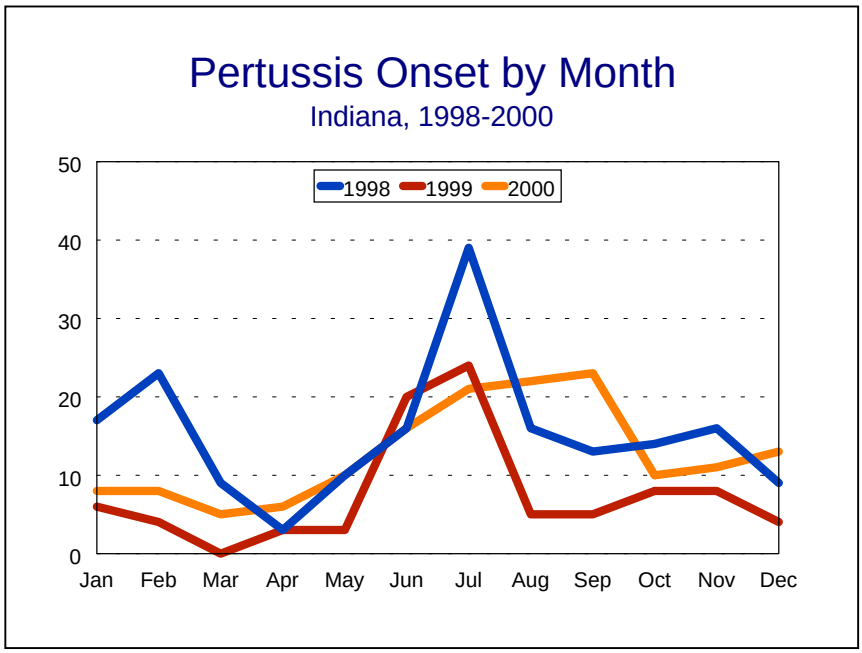
Through May 25, 2001, 19 cases of pertussis have been reported in Indiana, with five (26.3%) being in the 10-19 age group. These five cases have occurred in different counties. In the U.S., with over 1,500 cases being reported from Jan 1 - April 21, 2001, 34% of the cases have occurred in the 10-19 year age group. In the United States during 2000 (preliminary figures), 34% of over 6,700 cases occurred in the 10-19 year age group.

Older children and adults often serve as the source of infection for infants, who are at risk for the most severe consequences of infection. Often the infected adult or adolescent is not identified until the infant has been hospitalized and/or diagnosed. Many other adults and adolescents most likely go undiagnosed and serve as sources of infection in the family and community. A recent prospective study[1] conducted among adolescents and adults (10-49 years of age) in a managed care organization in Minnesota reported that " …the estimated annual incidence of pertussis was 507 cases per 100,000 person-years". The study, published in the May 1, 2001 issue of *The Journal of Infectious Diseases*, concluded that *Bordetella pertussis* may be a more common cause of cough illness among adolescents and adults than was recognized previously. The study further suggests that a booster dose of acellular pertussis vaccine at entry to middle school may be an effective strategy to prevent pertussis among U.S. adolescents.

Seasonality of Pertussis

Although pertussis has no distinct seasonal pattern (cases are reported in every month during the year), case reports do increase in the fall and summer months. During the five-year period from 1996-2000 period, 47.9% of all cases had cough onset reported during the four-month period from July-October. During the same five-year period, the peak month for pertussis cough onset always occurred in one of the months from July-October. July had the largest percent of cases (14.8%) for any one month in those five years. Figure 3 depicts the seasonal trend from 1998-2000.

Figure 3.



Recommendations

- Consider the diagnosis of pertussis in acute cough illness, regardless of the age of the patient, especially if the cough is associated with posttussive vomiting and/or gagging or if the cough persists for two weeks or longer.

- Report any suspected case of pertussis to your local or state health department immediately so that control measures can be implemented.

- Both culture and DFA testing should be performed on all suspected cases and symptomatic contacts of cases prior to the administration of antibiotics. See side bar related to diagnostic testing.

- The ISDH Special Reference Bacteriology Laboratory encourages laboratories to submit pertussis isolates. The ISDH laboratory, in conjunction with the Centers for Disease Control and Prevention (CDC) laboratories, can conduct antibiotic resistance testing and genotyping of pertussis isolates. This information would add to the public health implications and epidemiological understanding of the organism. Please call the Special Reference Bacteriology Laboratory at 317-233-8040 for questions about shipping pertussis cultures to the state laboratory.

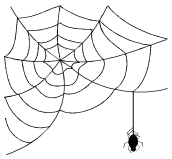
[1]Strebel, P, Nordin J, et al. Population-based incidence of pertussis among adolescents and adults, Minnesota, 1995-1996. J Infect Dis 2001;183:1353-1359.

Influenza: Being Prepared

During the 2000-2001 influenza season, Indiana, as well as all other states, experienced a significant delay in the distribution of influenza vaccine. It is our desire to provide you with credible information and to work cooperatively with you to reach a common goal. That goal is to establish contingency plans so that influenza vaccine is more accurately targeted to those who are at highest risk.

The Indiana State Department of Health will sponsor two identical half-day seminars titled "Influenza: Being Prepared" at our headquarters, 2 North Meridian Street, in Rice Auditorium on Monday, July 2nd from 12:30 to 4:00 p.m. and on Tuesday, July 3rd from 8:30 a.m. to 12:00 noon to discuss and disseminate information for implementing recommendations for influenza vaccine. The same presentation will be given on each date. A Centers for Disease Control and Prevention (CDC) representative and Dr. Deborah McMahan, Health Officer from the Allen County Health Department, will present comments and describe initiatives that may be used to help ensure that influenza vaccine is available to those at greatest risk. These meetings will serve as "roundtables" for health care providers, local health departments, pharmacies, and others with an interest in influenza vaccine.

We think that holding this seminar is an exciting and educational initiative and we hope for your participation. Please RSVP your attendance to Shawn Richards, at healthin@isdh.state.in.us or by calling 317-233-7740 by Wednesday, June 27th, as seating is limited.



Wonderful Wide Web Sites

ISDH Data Reports Available

The ISDH Epidemiology Resource Center has the following data reports and the Indiana Epidemiology Newsletter available on the ISDH Web Page:

http://www.statehealth.IN.gov (under Data and Statistics)

Indiana Cancer Incidence Report (1990, 95)

Indiana Cancer Mortality Report (1990-94, 1992-96)

Indiana Health Behavior Risk Factors (1995-96, 97, 98)

Indiana Hospital Consumer Guide (1996)

Indiana Marriage Report (1995, 96, 97)

Indiana Mortality Report (1995, 97)

Indiana Natality Report (1995, 96, 97)

Indiana Natality/Induced Termination of Pregnancy/Marriage Report (1998)

Indiana Report of Diseases of Public Health Interest (1997, 98, 99)

The following site allows access to the web page for any state health department in the United States:

http://www.polsci.wvu.edu/grad/klase/STATEHEALTH/sthlth.html

HIV Disease Summary

Information as of May 31, 2001 (population 5,840,528)

HIV - without AIDS to date:

312	New cases from June 2000 thru May 2001	12-month incidence	5.34 cases/100,000
3,350	Total HIV-positive, without AIDS on May 31, 2001[1]	Point prevalence	57.36 cases/100,000[1]

AIDS cases to date:

315	New AIDS cases from June 2000 thru May 2001	12-month incidence	5.39 cases/100,000
2,720	Total AIDS cases on May 31, 2001[1]	Point prevalence	46.58 cases/100,000[1]
6,194	Total AIDS cases, cumulative (alive and dead)		

[1]Counting only cases alive in May 2001

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in May *MMWR* Weeks 18-22		Cumulative Cases Reported January - May *MMWR* Weeks 1-22	
	2000	2001	2000	2001
Campylobacteriosis	48	28	113	95
Chlamydia	NA	NA	NA	NA
E. coli O157:H7	5	8	15	20
Hepatitis A	6	8	21	39
Hepatitis B	5	7	20	13
Invasive Drug Resistant *S. pneumoniae* (DRSP)	30	27	118	120
Gonorrhea	NA	NA	NA	NA
Legionellosis	0	1	9	6
Lyme Disease	2	1	2	1
Measles	0	2	0	4
Meningococcal, invasive	6	11	24	23
Pertussis	10	8	22	19
Rocky Mountain Spotted Fever	0	0	0	1
Salmonellosis	64	52	187	143
Shigellosis	220	25	344	108
Syphilis (Primary and Secondary)	NA	NA	NA	NA
Tuberculosis	7	6	53	35
Animal Rabies	0	0	0	1 (Bat)

For information on reporting of communicable diseases in Indiana, call the *ISDH Communicable Disease Division* at (317) 233-7665.

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The *Indiana Epidemiology Newsletter* is published by the Indiana State Department of Health to provide epidemiologic information to Indiana health professionals and to the public health community.